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(54) RECORDING AND REPRODUCING SYSTEM OF LINKED REPRODUCTION  
SYSTEM AND DEVICE AND METHOD WHICH ARE ASSOCIATED WITH THE  
SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To switch over from a stationary type digital audio unit to a portable type digital audio unit in a state where the hearing of a user is not interrupted between the digital audio units of the stationary type and the portable type.

SOLUTION: Data including contents which are being reproduced at present with the stationary audio unit 101 are transferred to the portable audio unit 102 through a mutual communication cable 217 and copied there. The portable audio unit 102 enters a reproduction stand-by state while monitoring the reproduced contents and the reproduction point of the stationary audio unit 101. The portable audio unit 102 starts reproduction from the same point of the same contents in a state which is seamlessly synchronized with a reproduction state in the stationary audio unit 101. The stationary audio unit 101 automatically stops reproduction after a prescribed period elapses and cuts power with the detection of the removal of the cable 217.

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## CLAIMS

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[Claim(s)]

[Claim 1]A recording and reproducing system of a coordinated playback system carrying out the transmission copy of the data containing contents under present reproduction at a recording and reproducing device taking a reproduction state in

said playback equipment and a certain synchronization in said recording and reproducing device and constituting reproduction from playback equipment so that a start is possible.

[Claim 2] A recording and reproducing system of the coordinated playback system according to claim 1 currently having made with data of the whole file containing contents under present reproduction about data which carries out a transmission copy from said playback equipment to said recording and reproducing device.

[Claim 3] About data which carries out a transmission copy from said playback equipment to said recording and reproducing device with data of the whole file containing contents under present reproduction. A recording and reproducing system of the coordinated playback system according to claim 1 currently having made with data of contents in before the file the back or order.

[Claim 4] A recording and reproducing system of the coordinated playback system according to claim 1 currently having made that it is selectable arbitrarily [ out of two or more contents set in said playback equipment ] about data which carries out a transmission copy from said playback equipment to said recording and reproducing device.

[Claim 5] A recording and reproducing system of a coordinated playback system given in either from claim 1 currently having made with a seamless synchronization which performs a reproduction start from the same point about the same contents about a reproductive synchronization with said playback equipment and said recording and reproducing device to claim 4.

[Claim 6] A recording and reproducing system of a coordinated playback system given in either from claim 1 considering as a synchronization which performs a reproduction start from a point which is different in before or back about the same contents about a reproductive synchronization with said playback equipment and said recording and reproducing device to claim 4.

[Claim 7] It goes into a reproduction standby state said recording and reproducing device monitoring contents and a reproduction point under present reproduction in said playback equipment after completion of said data transfer copy. A recording and reproducing system of a coordinated playback system given in either from claim 1 constituting so that reproduction may be started from a point which serves as the present monitor object about contents which serve as the present monitor object based on reproduction start operation to claim 6.

[Claim 8] Communication between said playback equipment and said recording and reproducing device is performed via a cable. A recording and reproducing system of a coordinated playback system given in either from claim 1 constituting in connection with extraction from said playback equipment or said recording and reproducing device of the cable so that a power supply may be disconnected in said playback equipment to claim 7.

[Claim 9] A recording and reproducing system of a coordinated playback system given in either from claim 1 performing communication between said playback equipment and said recording and reproducing device via radio and constituting with blocking of communication by the radio so that a power supply may be

disconnected in said playback equipment to claim 7.

[Claim 10]A recording and reproducing system of the coordinated playback system according to claim 8 or 9 constituting so that cutting of a power supply in said playback equipment may be performed after progress of predetermined time extraction of said cable or after blocking of said radio.

[Claim 11]A recording and reproducing system of a coordinated playback system given in either from claim 8 wherein said playback equipment is constituted in advance of cutting of a power supply accompanying said cable extraction or said radio blocking so that reproduction in playback equipment may be suspended to claim 10.

[Claim 12]A recording and reproducing system of a coordinated playback system given in either from claim 1 wherein said playback equipment also combines and has a recording function to claim 11.

[Claim 13]A recording and reproducing system of a coordinated playback system given in either from claim 1 wherein said playback equipment is deferred type audio equipment and said recording and reproducing device is portable audio apparatus to claim 12.

[Claim 14]A recording and reproducing system of a coordinated playback system given in either from claim 1 wherein said playback equipment is portable audio apparatus and said recording and reproducing device is deferred type audio equipment to claim 12.

[Claim 15]A recording and reproducing system of a coordinated playback system given in either from claim 1 wherein said playback equipment has a function equivalent to a function of said recording and reproducing device to claim 14.

[Claim 16]Playback equipment of a coordinated playback system constituting as what has a function as playback equipment in a recording and reproducing system of a coordinated playback system given in either from said claim 1 to claim 15.

[Claim 17]Transmission to said other apparatus of data characterized by comprising the following is performed simultaneously Playback equipment of a coordinated playback system constituting so that reproduction may be suspended automatically and a power supply may be disconnected after specified time elapse if it detects that communication which passes said two-way communication means according to an extrinsic factor stopped.

A means to reproduce information.

It has a two-way communication means to transmit and receive information among other apparatus and they are the contents under reproduction of information and reproduction by a user's operation.

[Claim 18]A recording and reproducing device of a coordinated playback system constituting as what has a function as a recording and reproducing device in a recording and reproducing system of a coordinated playback system given in either from said claim 1 to claim 15.

[Claim 19]Have the following and data transmitted via said two-way communication means according to a command transmitted via said two-way

communication means is recordedA recording and reproducing device of a coordinated playback system which starts reproduction by a user's operation and is characterized by a reproductive state synchronizing with a state of reproduction of said other apparatus monitored via said two-way communication means seamlessly.

A means which carries out record reproduction of the information.

A two-way communication means to transmit and receive information among other apparatus.

[Claim 20]A regeneration method of a coordinated playback system performing simultaneously a data transfer containing contents under reproduction of informationand reproductionsuspending reproduction automatically after specified time elapse if it detects that communication with the destination stoppedand disconnecting a power supply.

[Claim 21]Recording and reproducing systems of a coordinated playback system synchronizing seamlessly and performing reproduction of said transmitted data recording data transmitted according to an external commandand monitoring a reproduction state of the source.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention about reproduction of contents especially contents centering on a musical pieceand the contents containing an imagea character stringetc. widely among the devices which can communicate to two each otherAre a system which shares reproduction as it is possibleand reproductive sharing is attained by neither exchange of a mere recording medium nor the mere copy of dataIt is related with the recording and reproducing system of the coordinated playback system which synchronizes the same contents as the contents under present reproduction in real timeand shared them in on demand one. This invention relates to the device and method relevant to the system.

[0002]

[Description of the Prior Art]In recent yearsdevelopment is following noncommercial digital audio equipment by technical trendssuch as a miniaturizationlarge-scale-izinghigh-compression-rate-izingand a networkand two or more recording media and a recording format exist in the form according to each needs use. For examplemicro lightweight apparatus like a solid-state memory player using MP3 (MPeg audio layer3)The deferred type mass music server which used HD (hard disk) for the recording mediumDVD Audioa high-quality sound player like a Super Audio CDetc. go across a goods gestalt variably.

[0003]On the other handthe network of the digital AV equipment using IEEE1394 of the serial interface standard with a high-speed-data transfer function is also

progressing and the AV equipment corresponding to IEEE1394 is also increasing. On the other hand the music distribution enterprise using the Internet and a solid memory card has also been coming to the phase of utilization.

[0004]

[Problem(s) to be Solved by the Invention] Listening will be interrupted when music is heard with the deferred type digital audio equipment using mass HDD at the house and business such as going out occurs during listening.

[0005] When recording media are removable media such as MD (mini disc) and it is going to hear a continuation with a portable digital audio player, a mini disc is removed from deferred type digital audio equipment and the work of setting the removed mini disc to portable digital audio equipment is required and also discontinuation of listening occurs. In this case when I hear that the performance of the musical piece which was being listened to till then is stopped and it is and the state of discontinuation of listening is reheard by the going-out middle class I hear that it can resume only after being able to select a song in that same musical piece that was being listened to and it is. In other words I hear that it cannot continue as it is in real time and the musical piece which was being listened to till then with the stationary type appliance cannot be listened to with portable equipment and it is.

[0006] In the device of another side when this invention solves such a technical problem and it is under reproduction with one device, Synchronization reproduction of the same contents is enabled and it aims having no exchange of a recording medium and without discontinuation of contents playback at providing the recording and reproducing system of the coordinated playback system which can secure the continuity of contents appreciation and its associated equipment and a related method.

[0007]

[Means for Solving the Problem] This invention about a recording and reproducing system of a coordinated playback system solves the above-mentioned technical problem by providing the following means.

[0008] One device assumes that it has a regenerative function at least. This will be called playback equipment. A device of another side assumes that it has a recording function with a regenerative function. This will be called a recording and reproducing device. While reproducing contents such as a musical piece with playback equipment the contents are similarly reproduced with a recording and reproducing device other than the playback equipment as it is possible.

[0009] Therefore from the playback equipment data which contains contents under present reproduction in playback equipment is transmitted to a recording and reproducing device and is copied. At this time a recording function of a recording and reproducing device is used. Playback equipment of a transmitting agency and a recording and reproducing device of a transmission destination will share data of contents under present reproduction with playback equipment between this at least. During a transmission copy reproduction of the contents is continuing with playback equipment.

[0010]As a mode of data which carries out a transmission copythere is no necessity of limiting even the contentsData of the whole file containing contents under present reproduction (for examplewhen contents are musical pieces) It is good also as data of the whole album included with two or more of other contentsand the contentsOr it may make that it is selectable arbitrarily [ it is good also as data of contents which are in before the filethe backor order with data of the whole file containing contents under present reproductionor ] out of two or more contents set in playback equipment. As a means of communication for data transfera cable may be sufficient and radio may be used. As a cablea metal cable may be used and an optical fiber cable may be sufficient. As radioa general electric wave may be sufficientmicrowave may be sufficientand infrared rays may be used.

[0011]As mentioned abovein the state where playback equipment and a recording and reproducing device share data containing contents under present reproductionnothingand a recording and reproducing deviceIt is made to reproduce with playback equipment about the same contents as contents under present reproduction from data gained by a transmission copy using the regenerative function. At this timea reproduction state in playback equipment and a certain synchronization are takenand reproduction is started in a recording and reproducing device. As the synchronizationit may be seamless contemporary [ which performs a reproduction start from the same point about the same contents ]or may be contemporary [ which performs a reproduction start from a point which shifted to before or back for a while about the same contents ]. Or it may be contemporary [ which is called a reproduction start from a head of the contents ] again.

[0012]Also in a recording and reproducing devicethe contents will be reproduced by reproducing contents which are playback equipment as mentioned aboveand synchronization. Without bringing about a way piece which is perfect time rupture like [ in the case of conventional technology ] about the same contents between reproduction with playback equipmentand reproduction with a recording and reproducing deviceif it puts in another waysynchronization reproduction in the state where time cooperation was secured is made as it is possible. One contents are able to give a situation currently simultaneously reproduced with playback equipment and a recording and reproducing device to a user.

[0013]Thereforein a case where a place movement state (the example of representation is going out and a business trip) which moves from playback equipment under present reproductionand separates spatially is plannedBy making a function of a recording and reproducing system of this coordinated playback system exercisein spite of place movementAlthough a using device serves as a different thingcompletely without exchange of recording mediasuch as a disk and a tapeDiscontinuation of contents playback and convenience with new user-friendliness that it breaks offssynchronization reproduction of the same contents is enabled nothingand continuitysuch as listeningviewing and listeningappreciationetc. of contentscan be secured can be provided.

[0014]When especially contents are musical pieces as the method of another useit

is also possible to become renewable where it has special effects such as a chorus, an echo, and a beat, and to bring about abundance of appreciation by being able to shift the two same musical pieces a little simultaneously and reproducing. [0015] although it is usually a musical piece as contents, a character string in a device which the necessity of being caught by it does not necessarily have and reads out a novel etc. may be sufficient -- if digitized by carrying out -- a general talk -- language may be used. It may be digital video.

[0016]

[Embodiment of the Invention] Hereafter an embodiment of the invention is described in the gross.

[0017] The recording and reproducing system of the coordinated playback system of an invention of this application 1st is characterized by carrying out the transmission copy of the data containing the contents under present reproduction at a recording and reproducing device, taking the reproduction state in said playback equipment, and a certain synchronization in said recording and reproducing device, and constituting reproduction from playback equipment so that a start is possible.

[0018] About the operation by this 1st invention it is the above. It becomes that the paragraph of [The means for solving a technical problem] explained and the substantially same thing. Namely, after playback equipment and a recording and reproducing device share the data which contains the contents under present reproduction with playback equipment by a transmission copy. Since it becomes possible to acquire the state of taking a certain synchronization and performing synchronization reproduction with playback equipment and a recording and reproducing device about the same contents, it makes it possible to play the same contents in synchronization without being obliged without exchange of recording media, such as a disk and a tape, to discontinuation, although a using device serves as a different thing from playback equipment physically to a recording and reproducing device. Therefore, even if it is in the situations of moving a place spatially, such as going out especially, a time continuity jam enables contents offer to the user in the state where the continuity on appreciation was secured.

[0019] The recording and reproducing system of the coordinated playback system of an invention of this application 2nd has made in the 1st above-mentioned invention with the data of the whole file containing the contents under present reproduction about the data which carries out a transmission copy from said playback equipment to said recording and reproducing device. When the data of two or more contents exists in one file as two or more musical pieces are contained in the music album, for example, this is the thing in the case of carrying out the transmission copy of not one contents [under present reproduction] data but the data of the whole file containing the contents is described. By this, in spite of moving the place, it continues as desired and the appreciation as a file including the contents appreciated now, another contents which are related to the contents, or a contents group is made as it is possible.

[0020] However, in other inventions, a transmission copy shall not be restricting to

one contents [ under present reproduction ] data.

[0021]The recording and reproducing system of the coordinated playback system of an invention of this application 3rdIn the 1st above-mentioned inventionit has made with the data of the contents which are in before the filethe backor order with the data of the whole file containing the contents under present reproduction about the data which carries out a transmission copy from said playback equipment to said recording and reproducing device. This may carry out the transmission copy of one or more contents or another files which are not only before one file but before its fileandOr it has described that the transmission copy of one or more contents or another files behind the file may be carried out.

[0022]The recording and reproducing system of the coordinated playback system of an invention of this application 4th has made arbitrarily that it is selectable in the 1st above-mentioned invention out of two or more contents set in said playback equipment about the data which carries out a transmission copy from said playback equipment to said recording and reproducing device. Hereas a means to set two or more contents in playback equipmenta fixed recording medium may be used and a removable recording medium may be used. All may be whateversuch as a thing of a magnetic-recording typea thing of a magneto-optical recording typea thing of a phase change type record typeand a thing of a semiconductor memory methodas a method of a recording medium.

[0023]In this 4th inventionthe contents transfer copy in arbitrary combination is possible by specification of the program of the contents selection in playback equipment. In this caseas for the contents under present reproductionalways containing is usually preferred. Howeverthere is not necessarily the necessity of being caught by it and selection in the state where the contents under present reproduction are not included is also enabled. It correspondswhen it is judged with playback equipment that the contents under present reproduction are not preferred for a user. Such diversity and possibilities also permit this invention.

[0024]The recording and reproducing system of the coordinated playback system of an invention of this application 5th is made in the above-mentioned 1st - 4th invention with the seamless synchronization which performs [ synchronization / with said playback equipment and said recording and reproducing device / reproductive ] a reproduction start from the same point about the same contents.

[0025]The operation by this 5th invention is as follows. Just before leaving the placethe same contents are reproduced with playback equipment and a recording and reproducing devicebut reproduction contents become main [ playback equipment / a sub next door and a recording and reproducing device ] as it separates. since a substitute's contents and the main contents are just completely boiled in time and are seamless contemporary [ same ]in contents appreciationthe shift to the main from a substitute completely does not impress sense of incongruity -- it will become very smooth.

[0026]In the above-mentioned 1st - 4th inventionit is considered as the synchronization which performs a reproduction start from a point which is different in before or back about the same contents about the reproductive



synchronization with said playback equipment and said recording and reproducing device by the recording and reproducing system of the coordinated playback system of an invention of this application 6th. This has described that this invention is not what is not necessarily limited for the reproduction synchronization of both devices only to a seamless synchronization.

[0027]The operation by this 6th invention is as follows. When especially contents are musical pieces by being able to shift the two same musical piece a little and reproducing it becomes renewable where it has special effects such as a chorus and an echo and a beat and the abundance of appreciation is brought about. It becomes possible to a user to tell clearly that the present reproduction mode is space move mode.

[0028]The recording and reproducing system of the coordinated playback system of an invention of this application 7th In the above-mentioned 1st – 6th inventions said recording and reproducing device it goes into a reproduction standby state monitoring the contents and the reproduction point under present reproduction in said playback equipment after completion of said data transfer copy. It is constituted so that reproduction may be started from the point which serves as the present monitor object about the contents which serve as the present monitor object based on reproduction start operation. This is equivalent to what described the art of seamless synchronous reproduction on the concrete level more.

[0029]The operation by this 7th invention is as follows. In order to perform data transfer communication by a cable or radio is possible for playback equipment and a recording and reproducing device. It is possible for a recording and reproducing device to monitor the reproduction state of playback equipment in real time via the means of communication. It is considered as a reproduction standby state monitoring of which point reproduction is performing in the contents which contents are being reproduced now again. And when the reproduction start operation by a user occurs it becomes possible about the contents of the present monitor object to reproduce with sufficient timing from the point of the present monitor object.

[0030]Although operation of the user to reproduction of a recording and reproducing device will usually be performed in a recording and reproducing device there is not necessarily the necessity of being caught by it and it may be made to perform the operation in playback equipment.

[0031]About the reproduction start of a recording and reproducing device there is not necessarily the necessity of being a thing resulting from user's operation and simultaneously with the end of a contents data transfer copy a reproduction start may be automatically carried out after progress of the predetermined time after an end. Or it may originate in the cable extraction and the radio blocking which are mentioned later and a reproduction start may be carried out.

[0032]The recording and reproducing system of the coordinated playback system of an invention of this application 8th In the above-mentioned 1st – 7th

invention communication between said playback equipment and said recording and reproducing device is performed via a cable and it is characterized by constituting in connection with the extraction from said playback equipment or said recording and reproducing device of the cable so that a power supply may be disconnected in said playback equipment. This describes when the operation stop of the playback equipment of the transmitting side is carried out.

[0033] The operation by this 8th invention is as follows. If a user leaves that place in this invention the playback equipment of the transmitting side will assume becoming unnecessary on use. When leaving the place a recording and reproducing device will be carried but since the recording and reproducing device is connected via the cable to playback equipment when moving it is necessary to carry out extraction of the cable. Playback equipment will turn OFF a power supply if the cable extraction is detected. There is no necessity of operating power OFF in playback equipment itself as a user and there is operational convenience. The useless power consumption depended [ drive / continue / playback equipment ] can be prevented.

[0034] Detection of extraction of the cable having been carried out as detection of cable extraction from the recording and reproducing device besides detection of extraction of the cable having been carried out from playback equipment may be sufficient. The time of the extraction of the both sides being detected may be sufficient.

[0035] It may also take into consideration that persons other than a user remain on that occasion and mode setting may constitute so that continuation of a drive of playback equipment may be performed.

[0036] It is not necessary about the power OFF of playback equipment to necessarily make cable extraction into requirements depending on the case. That is a cable keeps connected with playback equipment and the situation of carrying a recording and reproducing device is assumed. Therefore when it detects that communication between playback equipment and a recording and reproducing device is stopped beyond over predetermined time not the extraction of a cable but after a transmission copy it may constitute so that the power supply of playback equipment may be turned OFF.

[0037] The recording and reproducing system of the coordinated playback system of an invention of this application 9th In the above-mentioned 1st – 7th invention communication between said playback equipment and said recording and reproducing device is performed via radio and with blocking of communication by the radio it constitutes so that a power supply may be disconnected in said playback equipment. Although the 8th above-mentioned invention explained the case where communication was performed via a cable I hear that it is applied also when the same thing is radio and it is.

[0038] In the 8th–9th above-mentioned invention it is constituted by the recording and reproducing system of the coordinated playback system of an invention of this application 10th so that cutting of the power supply in said playback equipment may be performed after progress of predetermined time the extraction of said

cable or after blocking of said radio.

[0039] The operation by this 10th invention is as follows. When the user separates from the place in the recording and reproducing device currently carried, continuous reproduction of contents has already started but reproduction of the succeeding same contents is continued over predetermined time also at playback equipment. Although the deferred type thing of playback equipment is common, the ability to regenerate and regenerative function are usually excellent compared with a portable thing in many cases. The usage pattern of separating from the place is taken performing coordinated reproduction with the device of a cellular phone simultaneously experiencing the contents playback in outstanding its ability to regenerate and function. And the power supply of playback equipment is turned OFF after progress of predetermined time. When separating from the place suddenly, the original contents playback is not suspended but it separates fully experiencing the original contents playback. That is, a dynamic shift is possible. a user -- it becomes FRIENDLY continuous reproduction.

[0040] In this case even if a communication configuration is a thing of cable use it is not necessary to necessarily make cable extraction into requirements. What is necessary is to connect the cable in always and just to turn OFF the power supply of playback equipment after specified time elapse based on detection of the communicating state having been stopped.

[0041] In the above-mentioned 8th - 10th invention in advance of cutting of the power supply accompanying said cable extraction or said radio blocking, said playback equipment is constituted by the recording and reproducing system of the coordinated playback system of an invention of this application 11th so that the reproduction in playback equipment may be suspended. This has described making it suspend reproduction motion based on the reproduction stop instructions by a control signal rather than making it stop by the power OFF although the reproduction motion of playback equipment is stopped. A power supply is turned OFF after the reproduction stop by such control.

[0042] In the above-mentioned 1st - 11th invention as for the recording and reproducing system of the coordinated playback system of an invention of this application 12th, said playback equipment also combines and has the recording function. Although the playback equipment which it is under data transfer is generally a deferred type in many cases, there is no necessity of restricting such deferred type playback equipment to the thing only for reproduction and it may have a record reproduction function. However, in order to acquire the expected function and an operation and an effect of this invention as a device of a transmitting agency, it is clear that it is not necessary to necessarily have a recording function, neither, and the opinion of this is carried out.

[0043] As for the recording and reproducing system of the coordinated playback system of an invention of this application 13th, in the above-mentioned 1st - 12th inventions, said playback equipment is deferred type audio equipment and said recording and reproducing device is portable audio apparatus.

[0044] The operation by this 13th invention is as follows. The record reproduction

of the coordinated playback system said to this invention has the most suitable audio as the contents. When it must stop having to leave the spot such as going out while listening to a certain musical piece Even if it does not do the troublesome work of removing a recording medium from deferred type audio equipment and moving to portable audio apparatus Listening to succeeding the musical piece itself which was being heard with deferred type audio equipment by portable audio apparatus as it is irrespective of on which ranking of the recording medium it is recorded now. Although the spot can be left and audio equipment changes to another thing there is convenience that the pleasure which music continued can be experienced.

[0045] As for the recording and reproducing system of the coordinated playback system of an invention of this application 14th in the above-mentioned 1st - 12th inventions said playback equipment is portable audio apparatus and said recording and reproducing device is deferred type audio equipment. This assumes the case of being contrary to the 13th above-mentioned invention.

[0046] The operation by this 14th invention is as follows. It is convenient to enjoy the same musical piece succeeding with deferred type audio equipment when it goes home from the state where the musical piece is enjoyed by portable audio apparatus during going out etc. At this time the transmission copy of the data of the musical piece under present reproduction will be carried out from portable audio apparatus at deferred type audio equipment and reproduction will be started. On the occasion of a transmission copy it is necessary to secure a communicating state beforehand.

[0047] In the above-mentioned 1st - 14th inventions as for the recording and reproducing system of the coordinated playback system of an invention of this application 15th said playback equipment has a function equivalent to the function of said recording and reproducing device. While the playback equipment of the side which transmits the data containing contents means having not only for reproduction but a recording function this enables it to perform synchronous coordinated reproduction which is a point of this invention which playback equipment with this recording function copied and mentioned above in response to the transmission of data containing contents from the recording and reproducing device by the playback equipment side. Two recording and reproducing devices are alike also in the function of synchronous coordinated reproduction with it and interactive nature is secured.

[0048] This application 16th invention is concerned with the playback equipment of a coordinated playback system and is constituted as what has a function as playback equipment in the recording and reproducing system of the above-mentioned 1st - coordinated playback system of the 15th invention. as the system by which this consists of playback equipment a recording and reproducing device and a means of communication -- coming out -- there is nothing the playback equipment as one element which builds such a system is described and when exhibiting the function of each above-mentioned invention it is useful playback equipment.

[0049]The playback equipment of the coordinated playback system of an invention of this application 17thIt has a means to reproduce informationand a two-way communication means to transmit and receive information among other apparatusTransmission to said other apparatus of the data which contains the contents under reproduction of information and reproduction by a user's operation is performed simultaneouslyDetection of that the communication which passes said two-way communication means according to an extrinsic factor stopped is characterized by being constituted so that reproduction may be suspended automatically and a power supply may be disconnected after specified time elapse.

[0050]The operation by this 17th invention is as follows. The recording and reproducing device of the other party is made to carry out the transmission copy of the data which contains those contents via a two-way communication meansreproducing informationi.e.contentsin this playback equipment. The transmission copy at this time is performed continuing reproduction of those contents. Before detecting the way piece of secession of a cableor radiothe reproduction state of the contents is maintained. And if the detection is performedthe reproduction state of the contents will be further maintained until predetermined time passes. And if predetermined time passesa power supply will be turned OFF after suspending reproduction. By thisdata required for the apparatus which a user carries is givenand the FRIENDLY end of reproduction in the form [ like ] where a user is seen off is attained.

[0051]this application 18th invention is concerned with the recording and reproducing device of a coordinated playback systemand is constituted as what has a function as a recording and reproducing device in the recording and reproducing system of the above-mentioned 1st - coordinated playback system of the 15th invention. as the system by which this consists of playback equipmenta recording and reproducing deviceand a means of communication -- coming out -- there is nothingthe recording and reproducing device as one element which builds such a system is describedand when exhibiting the function of each above-mentioned inventionit is a useful recording and reproducing device.

[0052]The recording and reproducing device of the coordinated playback system of an invention of this application 19thIt has a means which carries out record reproduction of the informationand a two-way communication means to transmit and receive information among other apparatusThe data transmitted via said two-way communication means according to the command transmitted via said two-way communication means is recordedreproduction is started by a user's operationand it is characterized by the reproductive state synchronizing with the state of reproduction of said other apparatus monitored via said two-way communication means seamlessly.

[0053]The operation by this 19th invention is as follows. If operation of coordinated reproduction is given in our recording and reproducing device in the state where contents with the playback equipment of the other party are reproducedthe data of the contents will be transmitted from the playback equipment of the other party via a two-way communication meansand the data will

be copied in our recording and reproducing device. An end of the copy will monitor the reproduction state of the playback equipment of the other party via a two-way communication means. That is it supervises which point is reproduced about which contents now and it is made into a reproduction standby state. And if operation of reproductive directions is given reproduction while taking the apparatus of the other party and a seamless synchronization will be started.

[0054]this application 20th invention is concerned with the regeneration method of a coordinated playback system the data transfer containing the contents under reproduction of information and reproduction is performed simultaneously if it detects that the communication with the destination stopped after specified time elapse reproduction will be suspended automatically and a power supply will be disconnected. This was replaced with playback equipment is described as a regeneration method and demonstrates the same operation as the above-mentioned.

[0055]Recording the data transmitted according to the external command and monitoring the reproduction state of the source the recording and reproducing systems of the coordinated playback system of an invention of this application 21st synchronize seamlessly and perform reproduction of said transmitted data. This was replaced with the recording and reproducing device is described as recording and reproducing systems and demonstrates the same operation as the above-mentioned.

[0056]Although it is corresponding to any [ of the above ] invention Performing cooperation reproduction using two devices The necessity of restricting only in the receipts and payments from the house which is now a building etc. necessarily has neither going out nor a business trip For example it is in the state which it is in the same house there is playback equipment of a transmitting agency in a certain room and there is a recording and reproducing device of a transmission destination in another room and connected both devices in always and it is also possible to constitute so that the same operation and effect as the above may be acquired. For example it is applicable to the exchange between sitting room and a single room the exchange between a single room and a bath etc.

[0057](Concrete embodiment) The concrete embodiment of the recording and reproducing system of the coordinated playback system in connection with this invention is hereafter described in detail based on a drawing.

[0058]Drawing 1 is a key map showing the procedure of the rough composition of the recording and reproducing system of the coordinated playback system in an embodiment of the invention and processing. As shown in drawing 1 the deferred type audio equipment 101 and the portable audio apparatus 102 are connected via the telecommunication cable 103 in which two-way communication is possible. At this time the user is hearing music with the deferred type audio equipment 101 and the main power supply of the portable audio apparatus 102 is not turned on and presupposes that it is in the state where only the communication function through the telecommunication cable 103 is functioning.

[0059](1) If a user performs the key input operations of going-out standby to the

deferred type audio equipment 101 the deferred type audio equipment 101 will turn ON the power supply of the portable audio apparatus 102 via the telecommunication cable 103.

[0060](2) Copy succeeding the album which contains the musical piece under present reproduction with the deferred type audio equipment 101 and the portion before and behind that via the telecommunication cable 103 in the unit which can be accumulated in the portable audio apparatus 102. The reproduction state of the deferred type audio equipment 101 is continued also in the meantime without breaking off.

[0061](3) If the copy of a file is completed the portable audio apparatus 102 monitoring the playback position of the deferred type audio equipment 101 via the telecommunication cable 103. If the same playback position with the deferred type audio equipment 101 on the file copied previously is sought and seeking is completed the portable audio apparatus 102 will notify a user of having gone into the reproduction ready condition (standby state).

[0062](4) A user performs reproduction start operation of the portable audio apparatus 102 after checking the notice.

[0063](5) The portable audio apparatus 102 reproduces the same point of the same musical piece at identical time in the state of synchronizing with the reproduction state of the deferred type audio equipment 101.

[0064](6) After that when actually going out a user will do extraction of the telecommunication cable 103 and will carry out the portable audio apparatus 102.

[0065](7) If the extraction of the telecommunication cable 103 is detected the deferred type audio equipment 101 will suspend reproduction after specified time elapse automatically and will turn OFF a power supply.

[0066] Drawing 2 is a block diagram showing the internal configuration of deferred type audio equipment and portable audio apparatus in the recording and reproducing system of the coordinated playback system in an embodiment of the invention.

[0067] As shown in drawing 2 the deferred type audio equipment 101 has two sets (HDD) of the hard disk drives 201, 202 and the bus connection is carried out by IDE bus 203. The bus connection of the IDE bus 203 is carried out to CPU bus 207 via IDE (ATA) / CPU bridge 204 and control of the hard disk drive 201, 202 is indirectly possible for CPU 205. The bus connection of an MP3 encoder / decoder 208 and IEEE1394 Link LSI 210 is carried out to CPU bus 207 as a control device and it is controlled by CPU 205. The memory 206 comprises the program ROM area and work RAM area of CPU 205. IEEE1394 Phy LSI 209 functions with the interface of IEEE1394 Link LSI 210. The control from CPU 205 carries out via the register of IEEE1394 Link LSI 210 about a required portion among the functions of IEEE1394 Phy LSI 209. As an input/output terminal with an external instrument besides the IEEE1394 input/output terminal 216 there are the optical I/F input/output terminal 215 handling the digital signal of PCM (pulse code modulation) or a bit stream and the analog input terminal 213 and the analog output terminal 214 handling an analog signal. An analog signal is outputted and inputted

by an MP3 encoder / decoder 208 as a PCM digital signal by which an A/D conversion is carried out by A/D converter 211 and D/A conversion is carried out by D/A converter 212.

[0068]The portable audio apparatus 102 has the CompactFlash (registered trademark) (CF) card slot 218 and is using the removable CompactFlash (CF) card 219 as the storage medium of data. The bus connection of this card slot 218 is carried out to CPU bus 223 via ATA / CPU interface 220 and control of CF card 219 indirectly inserted in the CF card slot 218 is possible for CPU 221. Other basic hardware blocks have the same function as the deferred type audio equipment 101. 221 CPU and 222 a memory and 224 Namely an MP3 encoder / decoder IEEE1394 Phy LSI and 226 225 IEEE1394 Link LSIs for an analog input terminal and 230 an A/D converter and 228 are [ an optical I/F input/output terminal and 232 ] IEEE1394 input/output terminals an analog output terminal and 231 a D/A converter and 229 227. However the function of the performance of CPU memory space and main LSI power consumption etc. are optimized for the portable audio apparatus 102.

[0069]And it is connected via IEEE1394 cable 217 of the two-way communication method which the IEEE1394 input/output terminal 216 of the deferred type audio equipment 101 and the IEEE1394 input/output terminal 232 of the portable audio apparatus 102 can detach and attach freely.

[0070]Drawing 3 and drawing 4 show the software configuration figure of the deferred type audio equipment in the recording and reproducing system of the coordinated playback system in an embodiment of the invention. Drawing 3 is a software configuration figure of the deferred type audio equipment 101. The layered structure of a hardware layer a device driver layer a base software layer and the application layer is accomplished sequentially from the bottom of the heap. The hierarchy of a driver layer to a higher rank is a software module it is mounted on the memory 206 and a command is interpreted and executed by CPU 205. The driver of the IDE/CPU bridge 204 is the ATA (IDE) control 311 and an exchange of the ATA command and data is managed. The MP3 encoder control 312 and the MP3 decoder control 313 which are the drivers of an MP3 encoder / decoder 208 perform control of the encoding function of an MP3 encoder / decoder 208 and a decoding function respectively. The IEEE1394 Link/Phy control 315 also performs control of the partial function of IEEE1394 Phy LSI 209 via IEEE1394 Link LSI 210 while controlling IEEE1394 Link LSI 210. The AV information transmission 314 is a driver group for supporting the real time transfer (isochronous transfer) of the AV information based on IEEE1394.

[0071]The operating system which uses each driver is mounted in the high order hierarchy of each driver. It realizes that the FAT (File Allocation Table) file system 307 treats the data on the hard disk drive 201 202 in the format based on a FAT filesystem. Bit stream record / reproduction 308 performs record of a up to [ the storage medium of an MP3 bit stream ] and reproduction using each driver. The IEEE1394 AV/C control 309 is an operating system which supports an IEEE1394 AV/C command set.



[0072]The application layer containing a user interface is mounted in an uppermost hierarchy. The file editing 301 supports each function of browsing of a filecopydeletionand movement. The MP3 sound recording 302 and the MP3 playback 303 realize creation of an MP3 fileplaybackfast forwarding reproductionrewinding playbacketc. The high speed dubbing 304 and the interdependent control 305 between apparatus are applications which provide high-speed dubbing between the apparatus connected by IEEE1394respectivelyand remote control using an AV/C command. The whole application layer is controlled by the application control 306. The real-time OS 310 manages the mediation between each task in the whole software.

[0073]Drawing 4 is a software configuration figure of the portable audio apparatus 102. Although a difference of the composition of hardware and the performance of CPUthe specification resulting from memory spaceand a function existsfunctional correlation of each software module is the same as that of drawing 3 fundamentally. 411 in a device driver layer NamelyATA (IDE) controlIn [ as for MP3 encoder control and 413AV information transmission and 415 are IEEE1394Link/Phy control MP3 decoder control and 414 412and ] a base software layerIn [ as for a FAT filesystem and 408IEEE1394AV/C control and 410 are real-time OS bit stream record / reproductionand 409 407and ] the application layerAs for MP3 playback and 404a file editing and 402 are [ the interdependent control between apparatus and 406 ] application control high speed dubbing and 405 MP3 sound recording and 403 401.

[0074]Nextit explains in the form which related with drawing 1 – drawing 4 concrete operation of the recording and reproducing system of the coordinated playback system in the embodiment of the invention constituted as mentioned above. In the following explanationthe data of the deferred type audio equipment 101 and the portable audio apparatus 102 and an exchange of a control signal shall be performed in both directions via IEEE1394 cable 217.

[0075]While reproducing the file of MP3 currently recorded by the regenerative function of the MP3 reproduction 303 on the hard disk drive 201 in the deferred type audio equipment 101If the keystroke of going-out standby is received from a userthe AV information transmission 314 will be started via the user interface of the interdependent control 305 between apparatusand the connection of IEEE1394 will be established to the portable audio apparatus 102.

[0076]If a connection is establisheda command will be published from the IEEE1394AV/C control 309 to an IEEE1394 busand the record possible capacity of CF card 219 on the portable audio apparatus 102 will be read. FAT filesystem 307and bit stream record / reproduction 308 are usedThe transfer file unit of contents having included the present playback position and the position of the file on a disk are computed based on the record possible capacity of CF card 219 on the portable audio apparatus read previously.

[0077]Then the file to transmit is read from the hard disk drive 201data is source-packet-ized by the AV information transmission 314and where a time stamp is added to a headerisochronous transfer is carried out to 1394 buses.

[0078]Data is read from the hard disk drive 201 at the rate sufficiently higher than the sum of the bit rate of the MP3 data which is considering real-time reproduction as the isochronous transfer rate of 1394 buses at this timeBy repeating buffering and the track jump of data by the ATA control 311coexistence of MP3 real-time reproduction and isochronous transfer without a breakdown is realized.

[0079]In the deferred type audio equipment 101after the end of isochronous transfer is continuing real-time reproduction of MP3.

[0080]Extraction of IEEE1394 cable 217 is carried out for a user going out etc. If IEEE1394 Phy LSI 209 detects the extraction of IEEE1394 cable 217the deferred type audio equipment 101 suspends reproduction after predetermined time automaticallyand turns off a power supply.

[0081]Nexta series of operations are explained from the portable audio apparatus 102 side. By the going-out stamback input from the user to the deferred type audio equipment 101the AV information transmission 414 is started via the user interface of the interdependent control 305 between apparatusand an IEEE1394 connection with the deferred type audio equipment 101 is established.

[0082]Since a command will be published from the IEEE1394AV/C control 309 of the deferred type audio equipment 101 to 1394 buses and read-out of the record possible capacity of CF card 219 will be required if a connection is establishedIt passes on 1394 buses by making into a response command capacity which computed the record possible capacity of CF card 219 by having started FAT filesystem 407and started and computed the IEEE1394AV/C control 409.

[0083]Thenin the deferred type audio equipment 101the file to transmit is read from the hard disk drive 201and source-packet-izes data by the AV information transmission 314and where a time stamp is added to a headerisochronous transfer is carried out to 1394 buses.

[0084]It is received from 1394 I/Fthe AV information transmission 414 develops a source packet to stream dataand the data by which isochronous transfer was carried out is recorded by bit stream record / reproduction 408 on CF card 219.

[0085]Completion of record will publish the command which starts the IEEE1394AV/C control 409 and reads the regenerative track of the deferred type audio equipment 101and a time code via 1394 buses. Interpreting the response command from the deferred type audio equipment 101and monitoring a playback position at any timebit stream record / reproduction 408 is startedand it goes into a reproduction standby state.

[0086]If reproductive key operation is performed by the userreproduction will be started from the same position as the regenerative track of the deferred type audio equipment 101 monitored via 1394 busesand a time codeand synchronous reproduction will be realized.

[0087]Theneven if a user does extraction of the 1394 cables 217 and goes out with the portable audio apparatus 102it is possible to continue listening in the form where the reproduction state of the deferred type audio equipment 101 was maintained.

[0088]As mentioned abovealthough one embodiment has been described in detailthis invention also contains the embodiment of the mode which changed as follows.

[0089]As the deferred type audio equipment 101it may constitute in a thing without the optical I/F input/output terminal 215the analog input terminal 213and A/D converter 211. As the portable audio apparatus 102it may constitute in a thing without the optical I/F input/output terminal 231the analog input terminal 229and A/D converter 227.

[0090]It may replace with ATA / CPU interface 220 in IDE (ATA) / CPU bridge 204 in the deferred type audio equipment 101or the portable audio apparatus 102and the bridge and interface which differ in specification may be used. It may replace with an MP3 encoder / decoder 208224and the encoder / decoderor the codec which differs in specificationssuch as MPEG and ATRAC (registered trademark)may be used. It is good also as removable semiconductor memory of other methods to replace with CF card 219and good also as built-in semiconductor memory. Or it may be made to serve a double purpose by the memory 222. Although IEEE1394 cable 217 is a metal cable in which high speed data transfersuch as 100M/200M400Mbpsis possibleit may replace with this and other metal cables or optical fibers of a method may be used.

[0091]Although already explainedas the playback equipment of the transmitting origin in the recording and reproducing system of a coordinated playback systemor a recording and reproducing device of a transmission destinationit may not be audio equipment but they may be audio visual devicessuch as a DVD player.

[0092]

[Effect of the Invention]According to this invention about the recording and reproducing systemdeviceand the method of a coordinated playback system. When the place movement states (for examplegoing out etc.) which move from the playback equipment under present reproductionand separate spatially are plannedby making the function of the recording and reproducing system of this coordinated playback system exercise in spite of place movementAlthough a using device serves as a different thingcompletely without exchange of recording mediasuch as a disk and a tapeDiscontinuation of contents playback and convenience with new user-friendliness that it breaks offssynchronization reproduction of the same contents is enabled nothingand continuitysuch as listeningviewing and listeningappreciationetc. of contentscan be secured can be provided.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]The key map showing the procedure of the rough composition of the recording and reproducing system of the coordinated playback system in an embodiment of the inventionand processing

[Drawing 2]The block diagram showing the internal configuration of the deferred type audio equipment in the recording and reproducing system of a coordinated playback system and portable audio apparatus in an embodiment of the invention

[Drawing 3]The software configuration figure in the deferred type audio equipment of the recording and reproducing system of the coordinated playback system in an embodiment of the invention

[Drawing 4]The software configuration figure in the portable audio apparatus of the recording and reproducing system of the coordinated playback system in an embodiment of the invention

[Description of Notations]

101 Deferred type audio equipment

102 Portable audio apparatus

103 Telecommunication cable

201202 Hard disk drive (HDD)

203 IDE bus

204 IDE (ATA) / CPU bridge

205221 CPU

206222 Memory

207223 CPU buses

A 208224 MP3 encoder / decoder

209225 IEEE1394 Phy LSI

210226 IEEE1394 Link LSI

211227 A/D converters

212228 D/A converters

213229 analog input terminals

214230 analog output terminals

215231 Optical I/F input/output terminal

216232 IEEE1394 input/output terminal

217 IEEE1394 cable

218 CompactFlash (CF) card slot

219 CompactFlash (CF) card

220 ATA/CPU interface

301401 file editings

302402 MP3 sound recording

303403 MP3 reproduction

304404 high speed dubbing

305405 Interdependent control between apparatus

306406 Application control

307407 FAT filesystems

308408 Bit stream record / reproduction

309409 IEEE1394AV/C control

310410 real-time OS

311411 ATA (IDE) control

312412 MP3 encoder control

313413 MP3 decoder control  
314414 AV-information transmission  
315415 IEEE1394 Link/Phy control

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